Peer Exchange Questions on Asset Management
Ontario

1. How is your organization using asset management in decision making and resource allocation?

a. Who are the primary users of asset management and how are they using it (staff level only, director, governors, etc.)

Development of the Asset Management Business Framework "To-Be" Model

Over the past three years the MTO has developed an AMBF model, which sets out the basic framework for the development of Asset Management within the organization. It is a blueprint of the organization's core business made up of:

–Processes
–Activities
–Linkages
–Roles & responsibilities

These items are calendarized to our annual investment cycle and show data/information flows and map out the intended use of management systems. The MTO AM model has five major integrated and iterative steps:

1. Setting the context
2. Identifying Needs
3. Evaluating solutions
4. Pursuing funding
5. Delivering programs

AM Tools Currently Under Development

The Ministry of Transportation of Ontario (MTO) is now in the process of implementing the Asset Management Business Framework (AMBF) and incorporating asset management concepts into its existing business processes. The basic objective of the AMBF is to help the MTO "make the right investments at the right time."

The AMBF emphasizes concepts such as the importance of considering needs and developing programs across different asset and work categories, rather than considering each category in isolation; the use of performance measures to help characterize the state of the Ministry's assets; and the importance of using quality data and systems to support decision-making.

A. Economic Analysis Tool

The AMBF was developed under the assumption that the MTO would use an economic analysis tool for evaluating the costs and benefits of project alternatives. This tool, the Priority Economic Analysis Tool (PEAT) is currently under development and will be reviewed in September 2004.

PEAT is a project-level economic analysis tool that will address gaps in the MTO's existing management systems. It will enable users to analyze rehabilitation and improvement projects for highways, intersections, and bridges using an economic approach that considers both agency and road user costs. The tool will also enable economic analysis of ferry projects based on agency costs.

PEAT will help the MTO answer the following questions:
· *Which projects should be included in the capital program for the current period?*
· *If there are two (or more) mutually exclusive alternatives for a project, which should be selected?*

To answer the first question, PEAT will calculate the benefit-cost ratio for "Do It Now" vs. "Do It Later" alternatives. The "Do It Now" and "Do It Later" alternatives are specified in terms of (1) an existing transportation facility, (2) a rehabilitated or improved facility, and (3) when the facility would be rehabilitated or improved under each of two alternatives.

PEAT will be developed as an Excel workbook compiling the best practices of established economic analysis models, and will incorporate a formula –driven design with minimal use of hidden macros. User-defined functions will be used where appropriate to streamline the design of the workbook and ensure maximum flexibility for future updates and enhancements to the tool.

B. Non-Economic Criteria

Economic evaluation is only one set of information that needs to be considered when evaluating and selecting between alternatives. MTO is also determining what non-economic criteria should be considered in the decision making process and how these will be used in an evaluation process. Examples of non-economic criteria include but are not limited to: community impacts, environmental impacts, consistency with growth management plans, construction timing etc. The evaluations will be applicable to all highway assets including pavements, structures, lighting, guiderail etc and also to maintenance, preservation, rehabilitation and expansion needs.

C. Trade-Off Matrices

Building upon the criteria developed above and using performance measure targets, matrices will be created that can be used to facilitate trade-off analysis between a variety of project types (physical condition, safety, operational) and also between asset types (bridges, pavements, ITS, ferries). Trade-offs will be done at a network (program), regional, corridor and project level.

D. Corridor Investment Plans

Building upon the corridor investment plans developed by the Asset Management Team, the MTO is now developing a corridor investment plan format/template that details the investment decisions on a corridor over a 25-year period. This includes rehabilitation, reconstruction, emergency work, non-routine and routine maintenance, and the associated soft costs such as design along with property acquisition costs for all highway assets along a corridor. The plans will also detail the performance of the corridor – condition (bridge and pavements), safety, and operational based on the proposed investments. The corridor investment plans will then roll up to a regional corridor investment plan and then ultimately roll up into a network investment plan.

The corridor investment plan will be automated and work within the ministry's existing operating system, either in MS Excel or MS Access. It will have the have the capability of producing various reports including an Evaluation Report summary, summary of the corridor, regional and network corridor investment plans, and Summary and analysis of performance measures ie: % highways and bridges in good condition by year.

2. Benefits to using Asset management

a. How has your system improved or your program changed due to the use of asset management principle and data?

- AM has influenced our funding agency to take a results-based approach to infrastructure management and they will now be requiring all ministries within the province with capital assets to report this way, following MTO's lead for AM on highways. MTO and others are now being requested to develop three and ten-year infrastructure management plans.
- Increased justification for investments by describing both economic and non-economic benefits, how investments contribute to network condition and performance and life cycle costing will be available.
- Increased ability to quantify overall infrastructure debt and future deficit based on various funding scenarios.
- Ability to track asset value for both management and financial accounting purposes
- Infrastructure management systems being updated to support asset management methodology (25 year time period of analysis, multiple

alternatives, predicting future condition/performance, determining outcomes of investment)
- More consistent analysis of investment across organization by utilizing common tools and methodologies (all within a common decision-making framework)
- More comprehensive trade off analysis at project and program level, within and across transportation modes

3. Barriers to using Asset Management

a. Data problems/integration/collection

- Data problems – data not current, not referenced geographically, not available (due to system shutdown for updates), data gaps, too much data in some cases and not always clear why this data is being collected, not enough data in some cases, (eg. Predicting asset condition over time for bridges, safety, mobility)
- Data integration – several silo systems, some systems linked but not all links are functional. MTO is currently finalizing a RFP be advertised in new year for the development of a replacement inventory system and integrated database of bridge, pavement and traffic data to support the needs of asset management and other applications that require data from different data sources within MTO.
- Data collection – organization eager to collect various types of data (eg. Roadside assets) before proper consideration of what data will be used for, how to keep current, costs to maintain, what system will be used for data storage, etc.
- Interfunctionality of legacy systems is difficult due to development architectures creating interface issues.

b. Percent of system or operation covered

- MTO data covers 100% of the provincial highway network however the province also provides some funding and is looking at addiiotnal programs to fund municipal road networks. Information on municpal networks is not currently available and the province is now introducing initial principles of asset management and inventory/needs data to municipalities.

c. Interagency cooperation

- MTO has many external stakeholders that support asset management
  - Our funding agency for capital, the Ministry of Public Infrastructure Renewal, has fully accepted the AM approach to infrastructure management and would like to follow our lead in developing a framework for all provincial infrastructure. The first major step in this direction is their implementation of results-based planning and the requirement for the

submission of a 3 and 10-year infrastructure plan from all government sectors with capital assets.

- The Ministry of Finance (MoF) has been a strong supporter of AM, specifically with the development of the asset valuation methodology. For the 2002/03 fiscal budget, MTO provided an opening balance and deterioration charge for tangible capital assets. This was the first time Ontario reported on its assets this way. MoF was a crucial team member during the development of the methodology, supported the calculation of the asset value and assisted with the reporting aspects.
- The Provincial Auditor was involved with reviewing the opening balance and depreciation charge reported in the 2002/03 budget. The audit concluded with an acceptance of the methodology and approval to continue with the method into the future indefinitely.
- Our funding agency for operating funds (basic maintenance – pothole patching, bridge washing, snow and ice control), the Management Board Secretariat, has been briefed on AM and how operational funding can save capital funding with preventive type treatments, or how a cut in operational funds decreases asset remaining life and asset value. However the importance and recognition of this link between the two funding agencies has been difficult due to other governmental fiscal pressures.
- The Ministry of Northern Development and Mines administers funding for capital construction for the MTO in the northern part of the province as an economic development agency. They are involved and make final decisions on project and corridor programming issues in northern Ontario.They support the results based planning process and are aware of the AM initiatives at MTO.

4. Are you using Asset Management for non-highway modes and how?

- Currently we have a consultant on board to determine how to evaluate the benefits and costs (both economic and non economic) for non-highway assets such as airports, ferries and both road and rail transit alternatives.
- Our desired end state is to incorporate these types of capital investments into the broader AM decision-making framework for all transportation assets. We also want the ability to perform trade offs between highway and non-highway mode investments. These trade-off matrices are currently under development.

5. What improvements would you recommend in the implementation of Asset Management?

a. Areas that need improvement

- Communications – can't just be at the initial project kick off and then die off. Must be clear and consistent throughout the development, implementation

and sustaining phases of the AM project. Need dedicated resources for this to successfully occur.
- Change Management – directly linked to communications. AM changes the work that many people do, and they need to understand why there is a change occurring, the benefits or advantages, that it is inevitable and that they have help and they're not alone. This also cannot just be an initiative at a project kickoff, but throughout the life of the project.
- Executive support – must be strong and visible throughout the life of the project.
- Intra-agency support – for AM to be successful, it has to be supported across the organization, not just within a small core group office. It needs regional people to fully support it's development and implementation, to act as a core group member geographically situated within a region. It has to be owned by a larger group.
- Accountability – Managers and staff must be made accountable for developing and implementing AM deliverables. Include these responsibilities within performance management plans.

b. Future research

- Development of operational improvement performance measures that are reliable and useful beyond simple accident rate information.

c. Data

- Resourcing of data acquisition and analysis is often time consuming and expensive. Automated methods of acquiring data and updating data would be beneficial.
- Further education of regional staff on the importance of consistent and accurate data acquisition in order for AM systems to be functional and credible.